

PROCESSED FOOD KNOWLEDGE PORTAL

LOW MEE PENG

Thesis submitted in partial fulfillment of the requirements
for the award of the degree of
Bachelor of Computer Science (Software Engineering)

Faculty of Computer Systems & Software Engineering

University Malaysia Pahang

13 JUNE 2012

Created with

 **nitro**PDF[®] **professional**
download the free trial online at nitropdf.com/professional

ABSTRACT

Processed food knowledge portal (PFKP) is concerned with delivering a suite of knowledge contents to users via the internet. However, some of the potential entrepreneurs often face the problem to get the guidance from the expert entrepreneurs who have more knowledge on processed food business. This knowledge portal site allows the members to create and share their knowledge since the portal containing three difference levels of users namely Expert Entrepreneur, Potential Entrepreneur, and Customer. The main objective for this project is to develop a knowledge portal for processed food industry. The processed food portal can assist the potential entrepreneurs in getting knowledge and can provide experts a facility to share their knowledge at forum. The portal also provides assistance in financing, training, and marketing to these potential entrepreneurs. The portal provides variety of products by category, tips, expert experiences, forum and financial assistance. Currently there is no government portal that specifically focuses on the processed food. The iterative and increment development methodology are used in developing the portal. This methodology can get the higher satisfaction from the users. The benefit of this project is to provide the communication between experts and potential entrepreneur and help the potential entrepreneur by giving them guidance and needed assistance information on their business. The users also can get the latest news and information about processed food. The project has successfully developed the portal with its features, and should be tested by various users to get their feedback on its benefits.

ABSTRAK

Portal pengetahuan makanan yang diproses (PFKP) adalah portal yang dapat memberikan pengetahuan kepada pengguna melalui internet. Walau bagaimanapun, terdapat usahawan yang berpotensi sering menghadapi masalah untuk mendapatkan bimbingan daripada pakar usahawan yang mempunyai pengetahuan yang lebih dalam mengenai perniagaan makanan yang diproses. Terutama sekali, portal pengetahuan membolehkan usahawan dan pakar usahawan untuk berkongsi pengetahuan atau pengalaman mereka disertai PFKP terbahagi kepada 3 tahap pengguna iaitu pakar usahawan, usahawan yang berpotensi and pelanggan. Objektif utama dalam kertas ini adalah untuk membangunkan satu portal pengetahuan bagi industri makanan yang diproses. Oleh itu, pembangunan portal ini boleh membantu usahawan yang berpotensi mendapatkan bantuan daripada pakar usahawan dalam forum. Portal ini juga menyediakan pelbagai perkhidmatan contohnya pemasaran, latihan, kewangan kepada usahawan yang berpotensi. Portal daripada kerajaan masih tidak spesifik pada makanan diproses. PFKP ini menyediakan pelbagai kategori produk, tips, pengalaman pakar usahawan, forum dan kewangan. Metodologi lalaran dan tokokan digunakan semasa membangunkan projek ini supaya produk yang dikeluarkan dapat memenuhi permintaan pelanggan. Faedah dalam dalam projek ini dapat memberkan komunikasi antara pakar usahawan dan usahawan yang berpotensi. Di samping itu, ia juga dapat memberikan bimbingan and maklumat yang diperlukan untuk usahawan yang berpotensi. Pelanggan juga dapat maklumat yang terbaru setiap masa. Walaupun, skrin dan beberapa ciri-ciri portal dapat dibangunkan dengan jayanya, pengguna portal perlu cuba menggunakannya bagi mendapat maklumbalas dari mereka.

TABLE OF CONTENTS

SUPERVISOR’S DECLARATION	iii
STUDENT’S DECLARATION	iv
ACKNOWLEDGEMENTS	v
ABSTRACT	vi
ABSTRAK	vii
TABLE OF CONTENTS	viii
CHAPTER 1	1
INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement	2
1.3 Objective	3
1.4 Scope	3
1.5 Thesis Organization	4
CHAPTER 2	5
LITERATURE REVIEW	5
2.1 Knowledge and Knowledge Management	5
2.2 Knowledge Management Systems	7
2.3 Knowledge Management Portal	7
2.4 Small and Medium Industries (SMIs)	8
2.5 Processed food	8
2.6 Malaysia Processed food Products	9
2.7 Processed food Portal in Malaysia	10
2.8 Studies on Technology	11
2.9 Development tool	

Created with


nitroPDF[®]
Created with
professional
nitroPDF[®]
professional
download the free trial online at nitropdf.com/professional
download the free trial online at nitropdf.com/professional

2.10 Development architecture method.....	18
CHAPTER 3.....	19
METHODOLOGY	19
3.1 Iterative and Incremental Development Methodology.....	19
3.2 The Justification of Iterative and Incremental Development Methodology	21
3.3 Methodology Development Phases	22
3.4 System Requirement	25
CHAPTER 4.....	27
IMPLEMENTATION, TESTING AND RESULT	27
4.1 Implementation.....	27
4.2 Testing	48
4.3 Result.....	48
CHAPTER 5.....	52
CONCLUSION	52
REFERENCES	54
APPENDIX	57
APPENDIX I	57
APPENDIX II.....	59
APPENDIX III	62
APPENDIX IV	65
APPENDIX IIV	66

LIST OF TABLES

Table 2-1: Processed Food Categorization 9

Table 2-2 : Comparison between ASP.NET, PHP and JSP. 14

Table 2-3: Comparison number of registered project per platform between ASP.NET, PHP, and JSP 14

Table 2-4: Comparison between window and Linux 16

Table 2-5: Comparison common desktop virtual machines between Windows and LINUX OS operating system. 17

Table 3-1: The PFKP development process using the Iterative and Increment Methodology..... 22

Table 3-2: Hardware requirements for PFKP development 26

Table 3-3: Software requirements when to develop Processed Food Knowledge Portal26

Table 4-1: Administrator table 30

Table 4-2: Experts table..... 31

Table 4-3: Category of baked food for cookies table 33

Table 4-4: Create topic table 36

Table 5-1: Comparison feature between the four existing system 57

Table 5-2: The PFKP development process using the Iterative and Increment Methodology..... 59

Table 5-3: Test cases 62

LIST OF FIGURES

Figure 2-1: Knowledge derived from theories, information and experience	6
Figure 3-1: Iterative and Incremental Development Methodologies	20
Figure 3-2: Workflow of PFKP development process	21
Figure 4-1: PFKP ERD Diagram.....	29
Figure 4-2: Commands create the Administrator table	30
Figure 4-3: Commands to create the Experts table	31
Figure 4-4: Add new entrepreneurship expert form.	32
Figure 4-5: The insert commands to add the new entrepreneur into database.	33
Figure 4-6: Commands to create the cookies table	34
Figure 4-7: Add baked food products form.....	35
Figure 4-8: The commands insert the products information into database.	36
Figure 4-9: Commands is use to create topic table.....	37
Figure 4-10: Create topic form	38
Figure 4-11: Commands insert the topic into the database.	39
Figure 4-12: upload file	40
Figure 4-13: Login form.	40
Figure 4-14: Login commands for users by input the username and password.	41
Figure 4-15: Commands connect to the database.	42
Figure 4-16: User as the potential entrepreneur register form.	43
Figure 4-17: Assistance information from difference Department.	43
Figure 4-18: XAMPP contain Apache HTTP Server, PHP, MySQL, phpMyAdmin	45
Figure 4-19: XAMPP Control Panel Application	45
Figure 4-20: Start the Apache Server and MySQL	46
Figure 4-21: Test the server is running.....	46
Figure 4-22: Create Database by click the phpMyAdmin at the left menu	47
Figure 4-23: phpMyAdmin Start Page	47
Figure 4-24: Home page of PFKP	66
Figure 4-25: Product category	67
Figure 4-26: Product category for baked food.....	67

Figure 4-27: Upload and view file.....	68
Figure 4-28: View all Expert entrepreneurs	68
Figure 4-29 : Update experts profiling	69
Figure 4-30: Forum.....	69
Figure 4-31: View experts profiling	70
Figure 4-32 : View and delete News	70
Figure 4-33: Expert's Product information	71
Figure 4-34: Forum post comment	71
Figure 4-35: Homemade processed food.....	72
Figure 4-36 : Marketing Assistance	73
Figure 4-37: Product Gallery	74
Figure 4-38: Training Assistance	75
Figure 4-39 : Financial Assistance	75
Figure 4-40: Machine Assistance	76

CHAPTER 1

INTRODUCTION

This chapter discusses about the need to have a knowledge portal for food processed. This chapter comprises of five sections: The first section describes the background of the project. The second section describes the problem statement of the project. The third section describes the objectives for the project and follow by the fourth section describes the scopes for the project. Finally the paper organization is described in section five.

1.1 Background

Food is an essential resource in the human lives. In Malaysia, Department of Agriculture in each state play an important role in the development of enterprise processed food in food industry. There are varieties of ways to produce a processed food and the raw materials used are also varied, such as from grain, fruit, vegetables, and from livestock such as fish poultry, lamb and cattle.

Starting an agricultural based processed food business is not difficult but to be a successful entrepreneur is somewhat difficult. Currently, entrepreneurs in Malaysia who are venturing into processed food have carried out on their own or by the assistance from the Department of Agriculture to launch their business processed food. There are

a variety of processed foods carried out in Malaysia. This is based on from my observation from after meeting with some entrepreneurs in Kuantan. I also gain a lot of information and knowledge from them on how to manage their processed food business.

Nowadays, some potential entrepreneur want to get further information the about the processed food in their business, they need to find by themselves to get the information, meet the Department of Agriculture for each state, or from the expert entrepreneur to get the information. Since this is due to the potential entrepreneur lack of information on the internet about the need of industry processed food.

Seeing the importance of this information to the entrepreneur, it is better if we can use internet to develop a database or portal that can be used by entrepreneur and to share their opinion or give some idea or suggestion. The proposed portal also benefits any individual in Malaysia and other countries to understand and know how to develop a food processing business. Thus the proposed development of processed food portal can assist the potential entrepreneurs in starting their processed food business, as well as providing the expert entrepreneurs to provide information and share knowledge of processed food business. Besides, this portal also developed to support the Department of Agriculture to assist entrepreneur on process food knowledge.

1.2 Problem Statement

Processed food is the food to give convenient to all consumers such as children, adult, worker, or housewife. However, there is no a certain portal specific for processed food to the potential entrepreneur in Malaysia. Some entrepreneurs face have difficulty in finding guidance from expert entrepreneur who have better knowledge on how to start the processed food business. The entrepreneurs need to find the expert entrepreneur through the person that they know or they need to find on their own.

The entrepreneurs often face problems in marketing their product because lack of marketing and promotional knowledge. The entrepreneur just selling their products where near from their house without selling their product to other place.

Besides, entrepreneurs have lack of information available to them especially financial assistance from various sources in Malaysia. The financial assistance can help the entrepreneur, especially potential entrepreneurs who want to start their business on the processed food industry.

1.3 Objective

The objectives of the research are to:

- I. Develop a knowledge portal for processed food industry.
- II. Provide features in the portal as the followings:
 - a) Guidance to potential entrepreneur in processed food.
 - b) Information on promotional and marketing
 - c) Information on industrial support and financial assistance.
- III. Support the Department of Agriculture to assist entrepreneur on Process Food Knowledge Portal.
- IV. Get the feedback from the entrepreneurs on the effective uses of the portal.

1.4 Scope

The following are the scope of this project:

- I. The system will provide the information only on processed food especially for Malaysia entrepreneur.
- II. The information gain and based on Kuantan entrepreneur.
- III. The system will be a webpage system.
- IV. The intended users for the system will following :
 - a) Potential processed food entrepreneur.
 - b) Expert entrepreneur.
 - c) Department of Agriculture.
 - d) Potential buyers of the product.

1.5 Thesis Organization

This paper consists of six (6) chapters. **Chapter 1** is discussing briefly on the introduction, problem statement, objective, scope and paper organization to the system. Introduction allows the readers to get the general idea in this knowledge management system that will be developed. It's will include the background information on this paper topic, goals that will be going to achieve and the direction of this paper research development also will discuss briefly in this chapter. Problem statement states the problems which cause this knowledge management portal system to be developed. Objective is the objective of developer who develops in this KMS portal. The scope is the limitation for this proposed system and users. The thesis organization is the sequence chapter will be discussing in this paper. **Chapter 2** discussed literature review will divide to two parts: explain about the researches that had been conducted which related with the current system and sources that can get from the journal, conference or the article and the technique will be used in conducting this system. **Chapter 3** is the Explanation about the methodology, the method, technique or approach that will be used for this project. Chapter 4 is discussing about the implementation, how to store database in this system. **Chapter 5** discusses the result and discussion. Example result analysis (objective is parallel to the problem project), project limitation (described the lack of this project) and the suggestion and project enhancement (idea that can improve in this project) in this system. **Chapter 6** is the last chapter discusses the conclusion which summarize about the developed system.

CHAPTER 2

LITERATURE REVIEW

This chapter discusses on what is knowledge management and knowledge management portal, the current knowledge portals available for processed food industry, and the categorization of processed foods. Then, the tool for development and methodology used are also discussed, and end up with the proposed software and hardware used for the project.

2.1 Knowledge and Knowledge Management

Knowledge is derived from theory, information and experience as shown in Figure 1, and through learning, knowledge and experience, we will gain wisdom. According to Oduoza and Harris (2011), there are two forms of knowledge—tacit and explicit. Tacit knowledge is a type of knowledge that is in a person brain, such as his expertise, perspective and values from his experience. Explicit knowledge covers the knowledge that can be presented and transmitted among individuals using information technology (Oduoza & Harris, 2011; Massa & Testa, 2009).

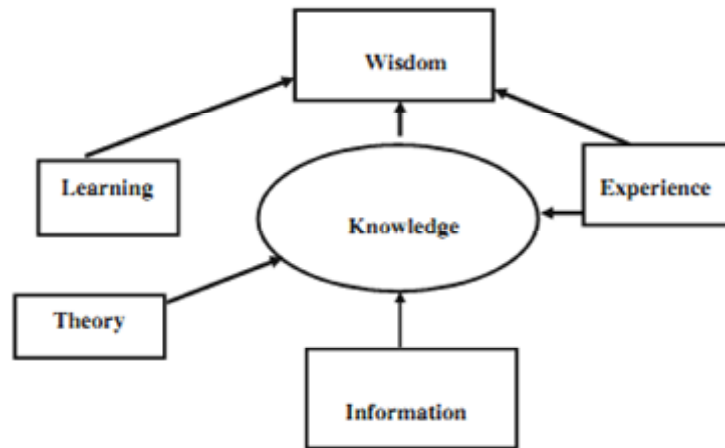


Figure 2-1: Knowledge derived from theories, information and experience

Nie, et al., (2010) stated that “knowledge management is mainly the management of knowledge itself, including knowledge creation, knowledge acquisition, knowledge processing, knowledge storage, knowledge dissemination and knowledge application”. Knowledge management also includes the management of resources and assets related to knowledge such as the process management on knowledge organization, knowledge infrastructure, knowledge assets, knowledge activities and knowledge staff; which aimed to improve the organization's innovation capability and efficiency and to achieve the value of knowledge assets (Ni et al., 2010). Capturing, storing, sharing, and creating the knowledge are processes in knowledge management which can be described into several steps as the followings (Ni et al., 2010; Massa & Testa, 2009):

1. Acquisition and processing of knowledge
2. Storage and retrieval of knowledge
3. Share and exchange of knowledge
4. Application and innovation of knowledge

2.2 Knowledge Management Systems

According to Xiao (2009) knowledge management system means how a system can store the knowledge base and makes the discovery, creation and use of knowledge under the specific context. Massa (2009) state that “De Carvalho and Ferreira argue that, although technology is not the main component of a KMS, it would be “a naive attitude” to implement a KMS without any technological support, whereas Walsham (2001) claims that leveraging knowledge through ICT is often hard to achieve”. Knowledge merely accumulated in workers’ brains, there is no way of recording it systematically and knowledge that is recorded in documents, it is very complicated to search for, retrieve, or review it. So, it is the reason why KMS encourage implementing in an enterprise (Tseng, 2008).

2.3 Knowledge Management Portal

A knowledge portal provides an interface or platform that can allow communication between each other through the portal (Zheng, 2010; Zulhafizsyam, 2011). The knowledge portal can help interested individuals and researchers to identify other experts that working in the same area. With the help of an information-filtering system, users of knowledge portal can collect useful knowledge quickly and easily from a Web database. Currently, commercial search engines such as Yahoo!, Lycos, and Google are ineffective for searching scientific publications accurately (Zulhafizsyam, 2011). According to Zheng (2010), there are certain characteristics that a knowledge portal should have which listed as the followings:

- a. Sharing the right knowledge to the right people at the right time.
- b. Focus locating and capturing knowledge, sharing and transfer knowledge and taking part in generating new knowledge.
- c. Provide knowledge as personnel-based solutions.
- d. Design - knowledge structure and logic
- e. Security – very important especially enterprise in supply chain.
- f. Navigation System- system of links in a web site that allow users to move from one place to another within the site. It is easy to find the information they want.

Created with

- g. Labeling system- describes how to name different type knowledge, and make a uniform identification rules to avoid synonymy, ambiguity and inconsistency exist.

2.4 Small and Medium Industries (SMIs)

Food processed based small and medium Enterprises (SMEs) has been recognized as one of the most important contributors for the economic development of many countries (Alam, 2011). SMEs also contribute in particular halal food because the growing demands of international markets. Most of the SMEs mostly face problem when they are growing compare to the large business. Factor affected their growth is increasing value of halal markets, substantial number of global Muslim population, expansion of consumers including the non-Muslims and potential market of in the Asian region. So, example institute plays significant role in make sure the raw material always available, expand the processing activity and promoting the growth of the targeted areas, R&D and enhance the competition (Alam, 2011). According to Omar and M.Yusof (2010) “Currently, the SMIs constitute approximately 84% of the manufacturing establishments in Malaysia.” It is meaning the percentage is quite high in Malaysia since the demand increase consistently due to the effort of Malaysia to be an industrialized country by 2020.

2.5 Processed food

Processed foods are produced from the raw ingredients into neatly packaged by using the manufacturing methods which have a longer shelf life. So to make sure the processed food have a longer live, some of the artificial ingredients needed to use. Example monosodium glutamate (MSG), flavors, preservatives, hydrogenated oil, fillers or artificial sweeteners. It mostly gives the convenience to save consumers time who can prepare their food quickly allowing immediate intake (Bolen, 2007).

2.6 Malaysia Processed food Products

Processed food industry is increasing year by year and one of the important components in the agro-based industry. According to Brant and Yong (2010), it has contributed about 10% of Malaysian manufacturing output which owned mostly by Malaysian. Table 2-1 shows the category and sub- categories of processed food.

Table 2-1: Processed Food Categorization (Boudro, 2009; Brandt, 2010).

Main category	Sub-categories	Examples of products
fish and fish products	processed seafood products such as frozen and canned fish, crustaceans and mollusks, shrimp and shrimp products	surimi, crackers, fish ball, belacan, fish fillet,
Livestock And livestock products	poultry and eggs, beef	Canned meat, Cured meat, Ham, Lunch meat, Sausage, Bacon, Gelatins, Fresh meat with additives
Dairy products	Cheese, Cheese food, powder	milk powder, sweetened condensed milk, milk (pasteurized , homogenized , skim, low-fat), sterilized liquid milk, ice cream, yogurt and other fermented milk, White flour, White rice, Salt, Macaroni
Fruit and vegetable	mangos, star fruits and papayas, dragon fruit	Canned fruit, Frozen fruit, sauces, Jellies, Jams, Pie fillings, juice, apple source Canned, Frozen vegetables,, French fries, potato chip
Beverage	soft drinks and mineral water	Instant breakfast drinks, Pepsi, coca cola, monster, iced tea, smoothies, tonic water
Baked foods	Biscuits, Cookies, Breads, Pastry, Pies, Cakes, Twice-baked goods, Tarts	Pasta, Cake mixes, Pie crust mixes, butter cookie, cookie Monster. Zwieback, Rusk, Egg Tarts, ,Bu

fats and oils product	Animal and vegetable fats and oils, Oilseeds	Refined oils, Cooking spray, Margarine, Salad dressing, BBQ sauce, Mustard, Ketchup, Mayonnaise, Peanut butter
Convenience foods	Snack foods, Street food	Pizza, Precooked foods, Frozen dinners, Breakfast cereal, Granola, Energy bars, coffee
Confections product	Candy, sugar, chocolate, Frozen desserts	White sugar, Brown sugar, Corn syrup, Rice syrup, Honey (unless raw), Syrups, Soft candies, Pudding, Dessert mixes, Whipped cream, black and white Chocolate, Marshmallows, Shredded coconut, Sugar substitutes. Rowntree's, Tootsie Roll

2.7 Processed food Portal in Malaysia

The current Processed food portal in Malaysia such as Jabatan Pertanian Pahang Portal, Agribazaar Portal, Direktori Industri Kecil & Sederhana Portal and Rasmi RISDA Portal. Comparison between four current processed food portals in Malaysia showed at APPENDIX I.

2.7.1 Jabatan Pertanian Pahang Portal (PJPP) (Portal Rasmi Jabatan Pertanian Negeri Pahang)

Jabatan Pertanian Pahang provide quality and effective services operators to entrepreneurs with the latest technology and regulatory services for increasing agricultural productivity and ensure the safety food in agriculture sector. Portal Jabatan Pertanian Pahang (PJPP) still has some unavailable module.

2.7.2 Agribazaar Portal (Agribazaar)

In Malaysia, a virtual one stop center call Agribazaar has been developed by the government for whose specialized interest in agriculture to purchasing or selling

agricultural-based products (Ahmad, 2008). Agribazaar is an information-based portal provided by the Department of Agriculture, Ministry of Agriculture and Agri-based Industry. The aim of this portal is to improve market reach, efficiency, and productivity among individuals or businesses. According to Ahmad and Zakaria (2008) “percentage of usage of the Agribazaar portal could be increased if it is made more competitive”. It means that Agribazaar has been found to be successful in connectivity between users locally and globally. The applications also has been accepted and utilized by a large number of users not just in Malaysia but also other countries as well.

2.7.3 Direktori Industri Kecil & Sederhana Portal (IKS) (Portal Direktori Industry Kecil)

IKS is the portal for connecting all the SMEs in the Malaysia and the best B2B (Business To Business) Platform for promoting the product locally as well as to Global Market. IKS will allow companies to sell their products online and making the possibility of having online revenue to be part of major companies income.

2.7.4 RISDA Official Portal (RISDA)

Portal Rasmi RISDA constitutes of the smallholder community that is progressive and prosperous through farming and commercial activities.

2.8 Studies on Technology

This section will discuss about the Programming Language, Database Language and Operation systems.

2.8.1. Programming Language

A programming language is a computer language programmers use to develop applications, or other set of instructions for a computer to execute. Below is a listing of several different programming languages such as PHP, ASP.NET and JSP

2.8.1.1. PHP

The PHP language is widely used as a popular server side language. A great number of open source software and company's web sites use PHP since it can enable high software productivity (Suzumura, 2008; Cholakov, 2010). Most of the PHP texts concentrate on algorithms and processes which data entering and retrieving data from MSQl databases. PHP include validating data, error checking and data security. All of the algorithms for accessing and using the data-base through SQL commands are very simple (Willian, 2010).

According to Yu (2010), advantage of the PHP as followings:

- a. Free
- b. Strong supporting
- c. Good portability
- d. Simple grammar
- e. Rapid development

2.8.1.2. ASP.NET

ASP.NET is an integral part of Microsolf.NET. It is very valuable tool for programmers and developers to build their web sites and web applications which can compiled with the languages VB and C# (Kozyk, 2008).

According to Kozyk (2008) and Php (2009), advantage of ASP.NET as followings:

- a. The code-behind allows you easier to maintain the code when it comes to large websites.
- b. ASP.NET drastically reduces the amount of code required to build large applications.
- c. With built-in Windows authentication and per-application configuration, your applications are safe and secured.
- d. Freedom of choosing from multiple languages (C#, VB.NET, C++, etc.)
- e. SQL Server is also very fast, secure, and it can store extremely large amounts of data; actually, there's no limit

- f. The Visual Studio .NET IDE, makes coding much, much easier. It can highlight syntax, let you know when the wrong stuff is commented, do command completion, and just plain help you organize better. Visual Studio has a really nice debugger.
- g. The Compiled Code (vs. PHP Interpreted Code)
- h. In ASP.NET it's easy to use threads and builds asynchronous handlers in your server-side web code.
- i. The ASP.NET framework is complemented by a rich toolbox and designer in the Visual Studio integrated development environment.

2.8.1.3. JSP

Java Server Pages (JSP) is a technology develops web sites based on the Java language JSP was developed by Sun Microsystems to allow server side development. JSP files are HTML files with special Tags containing Java source code that provide the dynamic content (Einstein, 2008).

According to Einstein (2008), advantage of JSP as followings:

- a. JSP are translated and compiled into JAVA Servest but are easier to develop than JAVA Servest.
- b. JSP have all advantages of Java i.e. write once run anywhere
- c. JSP uses simplified scripting language based syntax for embedding HTML into JSP.
- d. JSP containers provide easy way for accessing standard objects and actions.
- e. JSP use HTTP as default request /response communication paradigm and thus make JSP ideal as Web Enabling Technology.

2.8.1.4. PHP vs. ASP.NET vs. JSP

The table 2-2 shows the comparison between ASP.NET, PHP and JSP in security, Platform incompatibility, operating efficiency and cost. From the comparison, PHP is the suitable programming use to develop the portal. It is because security PHP is recognized safety performance, security in a system is the most important. PHP is the

multiplatform that enables works on many platforms, including Windows, Linux, BSD, Solaris, and Mac OS. Its operating efficiency is higher if compared to ASP.NET. PHP is free of charge, if compared to ASP.NET and JSP, it needs the higher cost. Table 2-3 is a comparison of the number of registered projects per platform between ASP.NET, PHP, and JSP. The number of registered projects is the highest if compared to ASP.NET and JSP. The number of registered projects per platform in years 2006 is 13167 and in year 2008 is 11728.

Table 2-2 : Comparison between ASP.NET, PHP and JSP (Yu, 2010).

	PHP	ASP.NET	JSP
security	PHP is a recognized safety performance	Safety is good, but there exist certain degree of security vulnerabilities	Safety is the highest
Platform incompatibility	multiplatform	Single platform	multiplatform
operating efficiency	higher	high	highest
cost	free	high	high

Table 2-3: Comparison of the number of registered projects per platform between ASP.NET, PHP, and JSP (Cholakov, 2008)

Number of registered projects per platform			
Language	ASP.NET	PHP	JSP
01.02.2006	210	13167	288
01.04.2008	3739	11782	718

2.8.2. Database Language

Database Language is a generic term referring to a class of languages used for defining and accessing databases. MySQL is the database language used to develop the PFKP.

2.8.2.1. MYSQL

DBMS using with PHP has MySQL, ORACLE and so on. Developers mostly use MySQL for it is open source, free, and efficient. MySQL is perfect database server software for medium and small application system. On the Unix/Linux system, MySQL also supports the multi-thread. MySQL is the choice PHP website for it is open source (Yu, 2008).

The database is the core of website, in which the data security is very important. The damage and lose or illegal duplication of data can cause a lot of trouble, moreover the mistake is very difficult to restore (Yu, 2008). MYSQL security measures as followings:

Account security: Each account of MySQL is composed of user name, password as well as the position, which includes reasonable rights and security check. There are three different security checks in the MySQL:

- a. Register confirmation
- b. Authorization
- c. Access control.

Stored data encryption: information encrypt to a small part, the password is the good example. These passwords should not store in the form of plaintext but encryption in the database. In general, the sensitive data is encrypted.

Characteristic of MYSQL as following: (Goritz, 2005)

- a. Free open source
- b. Compact
- c. Fast
- d. Reliable
- e. Robust
- f. Multiuser database server that can compile on many platform
- g. MYSQL database can easily be administered with the free tool MYSQL Control Center.

2.8.3. Operation systems

Windows is an operating system that provides a graphical user interface (GUI), virtual memory management, multitasking, and support for many peripheral devices (Webopedia, 2011).

Linux is a freely-distributable source operating that runs on a number of hardware platforms. Linux has become an extremely popular alternative to proprietary operating systems because it's free, and can runs on many platforms, including PCs (Webopedia, 2011). Characteristic LINUX is user ability to run Linux on multiple hardware platform and freedom to modify and customize the open source code.

2.8.3.1. Window VS Linux

Table 2-4 shows the comparison characteristic between window and Linux. Table 2-5 shows the comparison common desktop virtual machines between Windows and LINUX OS operating system.

Table 2-4: Comparison between window and Linux (LinuxRSP.Ru, 2007).

Description of the program, executed task	Windows	Linux
Web browser	IE, Netscape, Mozilla, Opera, Firefox	Netscape / Mozilla, Opera, Firefox, Galleon
License	RM 266,000	free
Application Deployment Time(Each Application)	18 days	12 to 18 months
Console FTP-clients	FTP in Far, ftp.exe, Ncftp	Ncftp, Lftp.Avfs.
Work with compressed files	a. WinZip b. WinRar c. 7-Zip d. Win ACE e. Ultimate Zip	a. LinZip. b. Gnozip. c. Unace. d. Gnochive. e. File Roller.
CD player	a. CD player, b. Win amp, c. Windows Media Player	a. Sadp. b. Workman. c. Xmed. d. Grip
Powerful graphic editor in Photoshop style	a. Adobe Photoshop b. Macromedia Fireworks	a. Gimp. b. ImageMagick. c. I

	c. Paint Shop Pro d. Pixel32 e. Corel Photo Paint	d. CinePaint. e. Corel Photo Paint
Indemnification and Product Warranty	1 years product warranty	Warranty not provided

Table 2-5: Comparison common desktop virtual machines between Windows and LINUX OS operating system (Kind, 2009).

Host O	Virtualization Software	WINDOWS as Guest OS	LINUX as Guest OS	Mac OS X as Guest OS
Windows	VMware Workstation	Yes	Yes	no
	Microsoft Virtual PC	Yes	Yes	no
	SUN Virtual BOX	Yes	Yes	no
LINUX	VMware	Yes	Yes	no
	Citrix XEN	Yes	Yes	no
	Virtual Iron	Yes	Yes	no

2.9 Development tool

The development tool used in this project in designing the graphic user interface is Adobe Dreamweaver. Adobe Dreamweaver is one of the most powerful software programs in the creative design industry these days. There are a lot of advantages using Dreamweaver.

Dreamweaver is easy and efficient to use because it has the ability to select different views when creating web pages. Inside the Dreamweaver, we can see there are divided into three parts such as code view, design view and split view. A code view shows only the HTML code for the page while design view gives an indication of how the HTML page will appear in a browser. A split view allows you to see the code view and design view at the same time. If there is any change at the code, the effect of the change can be seen immediately (Dreamweaver, 2007).

Another great feature in Dreamweaver is the layout tool. You can use this to get an idea of where you put your navigation, menus, pictures, etc. Dreamweaver creates a lot of the code for the user already, it useful for those who have no idea what they are